

Lightning Incidence In The Southeast Brazil: Comparison Of Thunderstorm Days From Different Data Bases

O. Pinto Jr.¹, K. P. Naccarato¹, C. Campinho²

1. Instituto Nacional de Pesquisas Espaciais - INPE,

S. J. Campos, São Paulo, 12227-010, Brazil

2. Operador Nacional do Sistema Elétrico - ONS,

Rio de Janeiro, Rio de Janeiro, 20091-005, Brazil

ABSTRACT: This paper describes a comparative analysis of the lightning incidence in Southeastern Brazil in terms of thunderstorm days (also called keraunic level) observed at two different epochs and estimated by lightning data provided by the Brazilian lightning location system (BrasilDat), a VLF-LF network that partly covers the Brazilian territory. The first two set of data come from man-made observations done at two different epochs. One corresponds to observations made in the first half of the twenty century in the whole country from a small number of observation sites. In the Southeast there were 43 sites and the period of observations goes to 5 to 42 years at different sites in the period between 1910 and 1951. The other corresponds to observations made only in the 3 out of 4 Southeast states (São Paulo, Minas Gerais and Espírito Santo) between 1971 and 1984, considering a larger number (more than 200) of observation sites. However, the period covered by the observations change considerably in the different states, going from about 5 years in the state of São Paulo to about 14 years in the state of Minas Gerais. Both observations are described in the form of maps in the Brazilian Standard for protection of structures against lightning (ABNT NBR-5419), where they are used for lightning protection evaluation. In turn, the thunderstorm days estimated from lightning data obtained by BrasilDat are based on the assumption that if a lightning is recorded in a given area in a given day, this day is classified as a thunderstorm day in a that area. For the southeastern region, BrasilDat data are available for the last decade. The goal of this paper is to investigate if the data used in the Brazilian Standards are still adequate, based on the assumption that the data obtained from BrasilDat describes better the real lightning incidence in this region. For this purpose data are smoothed to give average values for a $0.5^\circ \times 0.5^\circ$ grid cell, taken into account the spatial limitations in the observations done in the first half of the twenty century. The results suggest a revision of the Brazilian standards in order to provide more realistic information for lightning protection. They may also contribute to studies related to the performance of transmission lines and substations.

*Correspondence to:

Osmar Pinto Jr. Instituto, Nacional de Pesquisas Espaciais - INPE, S. J. Campos, São Paulo, 12227-010, Brazil. E-mail osmar@dge.inpe.br